

10
MEDICAL EDUCATION:

APPRENTICESHIP & UNIVERSITY DEGREES.

THE

ANNUAL ORATION

DELIVERED BEFORE

The Hunterian Society,

BY

P. H. PYE-SMITH, M.D.,

Assistant Physician to Guy's Hospital.

PRINTED BY REQUEST OF THE COUNCIL.

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MR. PRESIDENT AND GENTLEMEN,

I propose, in this address, to offer the Society some considerations on the present state of Medical Education and on the methods proposed for its improvement.

The present interest of the subject, the frequency with which it is discussed, and the importance of the reforms or changes which are advocated, show that the state of Medical Education in this country is far from perfect.

But I hope to show you that we have little reason to be ashamed even of its present condition, and still less to doubt of its future improvement.

For, in the first place, I would remind you how recent is the growth of our system of education for the profession. Though some of our London schools can trace their origin to the last century, in clinical instruction or occasional courses of lectures, yet their existence as complete and well-organised institutions can scarcely be reckoned at above fifty years. The progress made in this period has been enormous, and probably at no time so great as during the last decade.

Next, we must remember that all which has been done has been effected by the unaided efforts of the profession. We have no assistance from the State, no endowments, no royal or municipal patronage. To England alone among the countries of Europe, and to medicine alone among the liberal professions, does this apply. All our progress has been effected by the public spirit of individuals; and under whatever disadvantages we still labour, we have at least the

priceless advantage of freedom—greater than all others, because it renders all others possible.

Thirdly, if we are inclined to lament the imperfections of our methods of professional education, we must remember that our profession itself is very young. This may be a paradox, but it is a true one.

From the revival of letters in the sixteenth century there has been a College of Physicians in London, and for a much shorter period a College of Surgeons, and a Company of Apothecaries; but the distinction between the physicians of the seventeenth and eighteenth centuries (men like Harvey and Sydenham, Mead and Heberden) and the apothecaries of the same period, was not that between the higher and the humbler members of one calling; it was a complete separation in the duties they performed and in the training they had undergone. Even for physicians, until recent times there were no means of education in England. They all gained their knowledge of the profession elsewhere, and their diplomas bear the names of Padua, of Leyden, or of Edinburgh.

Whether this is to be attributed to our remarkable national distaste for organisation of all kinds, and for academies in particular; or to the revolt of the practical English intellect from the book-learning which, until lately, constituted the whole of medicine—the fact is remarkable, that there was no place until the present century where English physicians were taught their profession. The most eminent of them were natural philosophers, like Gilbert, Wells or Thomas Young; or physiologists, like Harvey, Glisson and Willis; or scholars, like Freind and Mead; or political writers, like Arbuthnot; or learned antiquaries, like Sir Thomas Brown. With few exceptions, it may be said of these eminent men, that they knew everything except the profession which they practised. Surgery, as the name implies, was a handicraft rather than a profession. Surgeons were the servants, not the brethren, of the doctors of medicine, and were cuppers, bleeders, barbers, anything but what they are now—operating physicians. Apothecaries were strictly tradesmen.

learning their practice from their masters, like other apprentices. Their business was to collect and prepare drugs, and to sell them to their customers.

Physic, τὰ φυσικά, Natural Philosophy, had come to mean a purge, and Medicine, the art of healing, a nauseous draught. Physiology, the Institutes of Medicine—Pathology, the only sure basis of practice—were in their infancy, or rather, in embryo. There was no science, and no true art of medicine. Whatever book-learning did duty for it among physicians, whatever crude empiricism among apothecaries; whatever shrewd sense and manual dexterity among surgeons remained isolated, and, therefore, half useless. Whether as incompetent as (from no fault of their own) the great majority must have been, or whether raised above their comrades by the genius which overcomes every obstacle, and makes exceptions to every rule, the physicians, the surgeons and the apothecaries were educated apart, and belonged, in no sense, to the same profession. Even at the present day, it is a remarkable fact, troublesome to a writer and seriously mischievous to science, that the English language has no common term which includes us all—no equivalent to the old English word *leech*, the Latin *medicus*, the Greek *ιατρίη*, the French *médecin*, the German *Arzt*. We have only the ill-sounding title of “medical man,” for which all that can be said is that it is less offensive than “medical gentleman.”

Happily there is now little need to insist upon the unity of our profession. To whichever branch of it we belong, we have the same objects, the same methods, the same failures and successes. The general practitioner is, to my mind, the most logical and the most useful product of Medical Science. While using the drugs of physic and the mechanical remedies of surgery, he is, beyond his brethren, the Physician, in the fullest sense of the word; for he introduces his clients into the world, he watches over defects of development; he foresees and provides against the numberless accidents of childhood; he throughout life continues the medical adviser, the sanitary reformer, the true “practical physiologist.” *Il guérit quelquefois, il soulage souvent, il console toujours.*

Since there has been organized Medical Education in England, it has been common to every branch of the profession. We have all passed through the same training ; we all learnt the same subjects ; together we listened to lectures ; together we worked in the dissecting-room and the laboratory, in the wards and in the dead-house ; together we surmounted the various barriers set up to test our powers (stumbling, perhaps, at some), whether we chose the long and high-fenced Burlington course, or the shorter one which leads to Lincoln's Inn, or diverged into the bye-path meadow that leads across the Tweed, or into some other way still more smooth and broad.

This liberal plan of common education, notwithstanding all its defects, has united—nay, it has almost created the medical profession ; and it has raised the character and worth of every village practitioner. The astounding blunders of apothecaries which led to the easy and brilliant triumphs of the consulting physician or surgeon fifty years ago no longer exist. Only bonesetters, or herbalists, or prescribing druggists give us such opportunities now.

The difference between the course of two men leaving hospital does not depend on difference of education, or difference of ability ; it is rather that while the one is drawn by character or circumstance to immediate and active practice, the other prefers to wait, and to occupy his leisure in teaching and investigation : a leisure which is often undisturbed during the whole of a professional career. Even here the divergence is far from complete ; for, on the one hand, it is impossible to labour to advantage upon pathology without a more than speculative interest in the prevention and cure of disease ; and, on the other hand, it is to those who are engaged in general practice that we must look, to advance our knowledge in many particulars which cannot be studied in hospitals or in consulting practice—for instance, individual and family predisposition to certain complaints, the laws of contagion, and the peculiar endemic characters of disease.

While there will be general agreement that Medicine, as a whole, has gained by the breaking down of the barrier

which existed between physicians and apothecaries—not, I trust, by lowering the former grade, but by educating the latter on the same liberal and scientific plan—the natural divergence of which I just spoke, between the general practitioner and the consultant, and the equally natural distinction into the branches of medicine, surgery and obstetrics, continue, as they exist in France, and Germany and America, where their development is left to itself. Whether it is desirable to carry the division of labour further, for the sake of medical science, for the sake of the specialist, or for the sake of his patient, is a more delicate point to decide. I will only say, that the almost unanimous opinion of us, who can judge—whatever may be that of the public, who cannot—is that such specialization ought to be jealously watched, since it may easily lead to results injurious alike to the character of the profession, the character of the specialist, and the welfare of the patient. The only really satisfactory kind of specialism is where a broadly and deeply educated man adds to his knowledge of the profession as a whole, special proficiency in all its branches. We cannot all hope to attain such excellence; but I need not go beyond our own Society for a striking example of one who beside the highest qualifications of a pathologist and a surgeon, has better acquaintance with cutaneous diseases than professed dermatologists, better ophthalmic skill than most oculists, and sounder knowledge of syphilis than those who “devote themselves” to this single disease.

I may be allowed, before quitting this part of my subject, to add, that while urging the essential unity of our profession, and the uniform aim which should continue to guide our education, those of us who most clearly recognise the local and conventional character of the restrictions, expressed or understood, which apply to our practice in our several departments, are most bound to abide by those restrictions, for we have accepted them, and cannot deviate from them without loss of self-respect.

If the view I have taken is right—if Medicine is a profession, and not a trade—*i.e.*, if it serves the community, by

selling knowledge, and not by selling goods ; if it is an art* which depends, both directly and indirectly, upon science ; if it is in its principles one and indivisible, and in its practice harmonious, then we shall be agreed as to the common objects of all medical education, and can judge of the improvements in it, with reference to these objects.

I.

First, as to preliminary education ; we may congratulate ourselves on the great advance which has resulted from the regulations of late years (an improvement for which the Apothecaries' Company deserves remembrance), and hope for further progress in the same direction.

The better school education a boy has had (using the word education in its proper sense, of development of the powers of mind and body, especially power of application, of memory, and of self-control), the better will he succeed in any pursuit of life. As to what is the best kind of instruction, I confess I think that whatever can best be taught is best. The method is more important than the acquisition.†

But we must take care not to push back even preliminary professional training into school studies. The object of a school education, however brief and humble, or however elaborate and protracted, is to fit a man to perform, justly, skilfully, and magnanimously, the common offices of life. The best schools make *men*, not doctors, or merchants, or lawyers. If a peasant's child is taught only to read and write, and to know something of the birds and flowers of his native fields, he has the rudiments of a liberal education. But if a school-boy is taught book-keeping, because he is to be a merchant ; or French, because he is to be a diplomatist ; or fortification, because he is to be a soldier ; or chemistry, because he is to be a doctor ; his education, as a human being, has ended ; he has put on the collar, and begun the inevitable work of the mill.

* See Note A.

† See Note B.

In short, a liberal education ends as soon as anything is taught which is "useful"—in the vulgar sense of the term—useful toward making money. And even in technical education, we should not, I hold, neglect the principle, that the object of life is not success, but happiness; the exercise of trained powers, in the fear of God, for the benefit, and with the respect of our fellow-men.

Leaving school education, the next question is whether it is desirable for the special scientific training which is necessary for a student of medicine to be finished before he enters a hospital. Where are the elements of mechanics and physics, of chemistry and biology, best learnt?

In most cases, I believe that they are best learnt at such places as University and King's Colleges in London, Owens College in Manchester, and the younger institutions which have happily arisen in Leeds, Bristol, and other great towns. Instruction in these subjects (not only by lectures, but in laboratories), with as much continuation of whatever may have been his favourite school study as a lad is inclined for, is the best way of filling up a year or two between leaving school and entering a hospital. I am speaking, of course, of those who do not take a full University course in Arts. This, when practicable, is, for clever and industrious men, an undoubted advantage—for the average, it is, on the whole, I think, a disadvantage. Those who do not read for honours acquire idle and extravagant habits, which unfit them for the service of so stern a mistress as Medicine.

There seems, however, to be no reason why our largest medical schools should not continue to offer opportunities for these preliminary studies, and there are not a few advantages in this arrangement. For the smaller ones, it would be much better if they would combine to form classes of adequate size and importance, or send their pupils to learn physics and chemistry and biology where there are appliances for teaching them thoroughly. Here we greatly need the co-ordination of studies, upon which I shall presently dwell.

It has been proposed that the year or two between school and hospital should be spent in a revived apprenticeship.

In deference to the respectable names by which this proposal has been supported, I wish to point out what seem to me to be the absolute objections to it. In effect, and the more effectually the longer the term of apprenticeship, it would be a return to the condition which I began by laying before you.

The objects of Medical Education have changed, and the old methods are useless or mischievous. Our practice does not now rest on tradition, on imitation, or on dogma. We are all agreed that treatment and prognosis must rest upon diagnosis, diagnosis upon pathology, pathology upon a knowledge of healthy structure and function, and this last upon knowledge of physics and chemistry.

We allow no one to touch a broken limb till he is familiar with the bones and muscles. We suffer none to attend a woman in labour who is ignorant of the foetal circulation. We forbid prescribing for a cough until the chest has been examined. Otherwise we may make bonesetters, or man-midwives, or quacks, but never physicians. To become familiar with the practices of medicine before beginning the study of its institutes is worse than useless; the time so spent is worse than wasted.

My own experience is that the most ill-prepared students in our wards are those who come up from a small country hospital, or a private surgery, with ability to compound pills and potions which shall not be obviously injurious, and familiarity with the names of diseases: they find they must forget everything which they have learnt before they can begin to learn aright. They have absolute faith in what is least certain, ætiology and specifics; and absolute scepticism as to what they have been taught to call new-fangled German "views"—these being ascertained facts which could be rigidly demonstrated to them if they had patience to hear, or observation to see, or modesty to learn. On the other hand, no pupils make such rapid progress in clinical work as those who do not know the

difference between a simple and a compound fracture, a cancer and a chancre, pneumonia and phthisis, but who have been well drilled in the facts of anatomy and physiology, who can use a microscope and a thermometer, and who, above all, have been trained to observe, to distinguish, and to learn.

A private medical pupil may, it is true, "learn his bones," but he learns them by the dullest and dreariest method; he may pick up a little chemistry, in the very worst way, from a book; and he may, if he is so inclined, make himself familiar with wild flowers. Meantime, he forgets his school learning, and contracts desultory, if not idle habits, which unfit him for the work of the hospital.

But it is said he at least acquires the art of compounding medicines. I answer that this art is acquired at far too extravagant a price. Every year fewer practitioners dispense their own drugs; and for those who do, the art of pharmacy has so developed, that they find it better to buy their pills and tinctures ready made than to spend what ought to be precious time in making them themselves. I do not say that skill in making a pill small, and tasteless, and consistent, is to be despised. Nothing is despicable which helps a patient; so knowledge how to make medicines that a child will not refuse, and how to prepare beef tea, and how best to mix a poultice, is desirable; but knowledge of the course of the lymphatics and of the chemistry of uric acid is essential. As for what are called elegant combinations, the less a student learns of them the better. The simpler his prescription, the more likely he is to learn its effect; and the British pharmacopœia, with that of his own hospital, will furnish him with enough combinations, and only too large a choice of drugs.

The proper time for acquiring knowledge of the details of practice is not at the beginning, but at the end of a hospital course. Then a year spent with a senior man in large practice may be of the utmost service. But, practically, this is very generally done. Few of our students enter at once on independent practice when they leave London. They serve a year or two as resident medical officer in a country hospital,

or they join a practitioner as assistant or junior partner. The only obstacle to the more formal adoption of this excellent introduction to the responsibilities of practice is the employment of unqualified assistants.

The best time for acquiring a knowledge of ophthalmic surgery, of diseases of children, of diseases of the skin, and other special branches of medicine, is in this interval between obtaining a qualification and entering on active practice. A year so spent at his own hospital, or in the provinces, is invaluable to a zealous worker.

Lastly, we are told that a private pupil will learn "how to deal with patients." Surely, sir, the only way to deal with patients is to find out what is the matter with them, and do what we can to relieve them. That he must not examine an abdomen with cold hands; that he must not bring tobacco smoke into a bedroom; that he must leave his umbrella in the hall, but his hat and gloves in the dining room; that he must address certain delicate inquiries to the nurse and not to the patient; these are matters of "deportment" which any man of good sense and good breeding will learn for himself, and which no apprenticeship will teach a boor. Such knowledge is no doubt valuable; so it is for a doctor to know how to keep accounts and how to drive a gig; but we must distinguish between what is valuable and what is invaluable.

II.

When a student has once entered at a hospital, there is little difference of opinion as to the general course of his work. Anatomy, organic chemistry, and physiology are the foundation of medicine; and to one who has been already taught the elements of mechanics, who has dissected a frog, and has become familiar with the reaction of the commonest salts, these studies are sure to be interesting, and progress in them will be rapid. I trust that nothing will be allowed to lower the standard of anatomical knowledge. It is the back-

bone of the profession, the one piece of absolutely objective science; it gives skill to the hand, power of observation to the eye, strength to the memory, and due appreciation of the eternal difference between knowing a thing and not knowing it. It answers to mathematics or classical scholarship as a training for the mind; and, in actual practice, it is only when we miss it that we learn by our loss its peculiar value. I venture to think, however, that the anatomy of the schools has been sometimes too pedantic. Minute "relations" have been taught which only exist when the limb is in an extended and supine position, and a knowledge of artificial cross sections has been demanded which the examiner could never have acquired but by making the section for the purpose. On the other hand, the relations of the arteries and viscera to the surface (the "landmarks" which Mr. Holden has so well described); the changes which the joints, the thorax, the eyes undergo in movement; the peculiarities of female and infantile anatomy have been too much neglected by examiners, and therefore, I fear, by teachers.

The teaching of Physiology, compared with that of anatomy in medicine, is like science compared with classics at schools. Classics have been taught for centuries; there is no lack of competent instructors or of good text books. But few schoolmasters understand natural science; it is not easy to decide which branch to teach: the materials are more troublesome to procure and to manipulate than a grammar and a dictionary; and the best ways of teaching are not yet settled. So with Physiology: there are few competent teachers, and those of us who teach find difficulty in selection from the vast and ever growing mass of facts. Until lately there were no adequate text books in English, and the practical teaching of physiology is beset with peculiar difficulties.

The first necessity of course is, that the teacher should know his subject, and that thoroughly and familiarly. The time will come when we shall have to separate the chairs of physiology from the faculty of medicine, as we have those of botany and chemistry. Meantime, the first duty of teachers

and examining boards is to insist on the broad and certain facts of human physiology being understood. There is abundance of perfectly well ascertained and demonstrable facts to be learnt without entering upon debateable ground. Secondly, demonstrations, histological, physical, and chemical, should be made a leading part of instruction, and (for those students who are adequately trained in preliminary knowledge) a laboratory should be open, where they can work as well as look on. Lastly, both in anatomy and physiology I would gladly see attendance at lectures made optional, and only the practical work of dissecting and histology enforced.

There is a kind of instruction intermediate between physiology and clinical medicine which I have myself attempted, and in which others I know are succeeding—I mean training in physical observation: in palpation of chest and abdomen, and joints in healthy subjects; in auscultation of the normal action of heart and lungs; in chemical and microscopical examination of secretions. There cannot be a better introduction to clinical work, nor one which more helpfully puts the scientific knowledge before acquired into practical application.

I would have written over the doors of every operating theatre, and ward, and out-patient room the words, "Let no one enter who is not an anatomist," *i.e.*, who has not passed his first college examination. The reasons which make this expedient are the same (though in less degree) which make intermeddling with practice before beginning anatomy useless or mischievous. Moreover, junior students while unable to profit themselves, are in the way of those to whom the close inspection of disease and remedies is above all things profitable.

But when once the primary examination is over, let the medical student give his whole time during daylight to seeing practice. If his own fault or misfortune has delayed this period, still the full two years should be exacted as the least time possible for this, the most important work of all. As to methods of clinical instruction it would, I think, be a great mistake if examining boards attempted to enforce one

and the same plan. I have seen the most different methods adopted by great clinical teachers; by the late Professors Bennett and Syme in Edinburgh, whose plans were almost opposite; by Sir William Gull at Guy's Hospital; by Trousseau at the Hôtel Dieu; by Oppolzer in Vienna; and by Traube in Berlin. Each of these eminent teachers had a somewhat different system, and each taught well; but the greatest teacher I have ever seen was Addison, who had no system at all.

As with the earlier studies, it seems to me desirable that no attendance on lectures should be enforced; let men learn from books instead if they prefer it, but insist upon attendance in the wards, in the lying-in-room and in the dead-house. Especially insist on every student having held clinical appointments, and worked at them.

No man ought to be admitted to the profession who has not mastered the elements of diagnosis, and especially physical diagnosis, and who has not become familiar with the ordinary forms of disease and their treatment; but if these qualifications be rigorously insisted on and properly tested, we must beware of exacting in addition a pretence of acquaintance with the more difficult parts of medicine, as functional diseases of the nervous system and insanity, with the more difficult parts of surgery as the operations of ophthalmic medicine, and with such outlying branches as medical jurisprudence. Such knowledge is rightly demanded of aspirants to the Fellowship of the College, or to the M.B. degree of London. But the great interest and importance of every department of the profession will lead to overloading the curriculum and discouraging thorough knowledge, unless we provide adequate time for their due assimilation; and it seems that two full years of clinical study, after passing the "first college examination," is all that we can prudently insist on.

We must remember, however, that many (at Guy's Hospital, about a third of our students) practically take a longer time, partly from failure to pass the final examination at their first attempt, in larger number from the attraction

of dresserships and other hospital appointments; and, best of all, from a wise appreciation of the enormous advantage they derive from a year spent in clinical studies, after they have obtained their diploma; and also that a man who has been well grounded in his chemistry, anatomy, and physiology, and who has learned the methods of diagnosis and the principles of treatment, will be a student of practice all his life.

Forensic medicine at least ought, it seems to me, to be cut out of the pass curriculum altogether. The best thing for nine out of ten of us to do, if we are called to a case of suspected poisoning, is carefully to abstain from any more ambitious procedure than tying up the liver, stomach, and intestines, with their contents, in separate securely sealed vessels, and sending them to a laboratory. As to other branches of medical jurisprudence, they are either what any competent practitioner with average common sense is equal to, or they demand far more special training and experience than can be fairly expected. The same applies to the important branch of public medicine which concerns itself with hygiene. The State has no right to expect that men, who have been adequately educated to treat disease, should have in addition these special branches of science at their command. These subjects ought to be thoroughly studied by those who can devote adequate time to the work, and such "experts" must be applied to, and paid, by public bodies who require their aid. For the majority of us to accept such responsibilities is unfair to the country, our more highly skilled brethren, and to ourselves.

III.

We have waited long and patiently for the realization of the Conjoint Scheme of Examination, but we seem as far off from it as ever. Meantime, there is a conjoint scheme which would answer our most pressing needs, and that with the smallest trouble or delay. Why should not the two Colleges

alone unite to give a conjoint examination and a conjoint diploma? The subjects of both the primary and the final examinations would naturally divide themselves between the two examining bodies, and the larger share of the fees would rightly be assigned to the College of Surgeons for the worthy maintenance of the Hunterian Museum. The College of Physicians is poor, but honest; and I think I know enough of the feeling of its Fellows to say that, so long as the object were attained, they would yield all advantages which the larger and wealthier corporation might claim. The Universities need not be included; indeed, I for one should be glad to see them deprived of the power of admitting to practice. Their degrees are valued (or ought to be valued) on other grounds, and neither Oxford, Cambridge, nor London graduates would lose anything if they were admitted to the register as members of the United Colleges of Physicians and Surgeons, instead of as doctors of medicine or masters of surgery.

Of course the real difficulty in the way of all conjoint schemes, the numerous bodies which admit to practice in Scotland and Ireland would remain. But the scandal would be no greater (though more manifest) than at present; and if some remedy were not devised from within, the next reforming Government would make short work of it.

If the Colleges of Edinburgh and Dublin were obliged to maintain a joint examination at a due degree of strictness, and the remaining corporations were deprived of a right to which they have long forfeited all claim, then would only remain (besides a licensing body for each division of the kingdom) the Universities to be dealt with; and so far from adding to the number of degrees which involve a license to practice, by giving that power to the new University of Manchester, it would be desirable (for the sake of putting an end to the abuse of the power) for the existing Universities to resign it.

The relation of medical education to University degrees is, however, a delicate subject to handle, and I must ask your indulgence in venturing upon it.

As far as the mere title of doctor is concerned, I am persuaded (notwithstanding certain correspondence in medical journals) that the bulk of the profession have too much self-respect to care whether they are called Dr. or Mr., and that very few desire to supplement deficiency of skill or knowledge by more or less dubious diplomas from abroad. It is generally supposed that the public think a man who calls himself "doctor" more learned than his neighbour—we know better. But since "the year of grace" at St. Andrew's, the title has become so common, and, as evidence of anything whatever, in itself, so worthless; that I strongly urge (and myself adopt) the rule of calling every registered practitioner by the same courtesy title of doctor. This has been long the practice in the country and in Ireland, as well as in the army. On proper occasions we all, of course, give our qualifications and their source, from Fellow of the Royal College of Surgeons of England down to Doctor of Medicine of—whichever is the meanest diploma-shop. On the other hand, it is much to be wished that the President of the College of Physicians and the other leading physicians would set the fashion of leaving others to apply the title if they please, instead of assuming it. I much prefer the style of M. Andral, M. Trousseau, M. Cruveilhier, as a matter of taste. Personally, I should like to drop a professional badge when in society or on my holiday; and I would rather not bear so obtrusively different an address from that of my surgical colleagues.

This, however, is a trifle. The important consideration is, not University titles, but University education. Is it desirable for the bulk of our students to enjoy a University education, and if so, how and when is it to be obtained?

The characteristics of a University seem to be:—

1. That its studies are more advanced than those of a public school.
2. That it provides for the study of all branches of knowledge, and is thus distinguished from a single Faculty.

3. That some of its students should not have in view any professional career, but knowledge for its own sake.
4. That there should be provision for investigation and discovery.
5. That its members should be numerous enough to make a community in themselves, different enough to prevent narrowness of thought and taste, and cultivated enough to maintain a high and liberal tone of public opinion.

I believe that at present Edinburgh is the only place in the kingdom which offers to a large number of medical students what may be fairly called University training, together with adequate professional education. Of the excellence of the teaching, and the admirable administration of the resources of that University, I need say nothing. We are all proud of it and of its teachers. I would only venture to remind our colleagues at Edinburgh, that the large influx of English students thither is not solely due to these advantages, nor to the attractions of that beautiful city. There is also the fact, that by spending a portion of their time there, a degree can be obtained with less difficulty than in London; with less expense than at Cambridge; and with less delay than at either. But when we talk at large of "University education," we must not (as is sometimes done) confound it with the attainment of a degree. To attend a provincial school of medicine for a few months, and have the privilege of passing an examination in the same place as theological students, is not a course of study which entitles a man to look down on a fellow-student who has successfully attained the honours and appointments of a great London school.

We hear much now-a-days of a "lost medical school" at Oxford. But a thing cannot be said to be lost which has never existed. A medical school might be a very good thing for Oxford, particularly if combined with dissecting-rooms and practical obstetrics, but I doubt whether Oxford would be

much service to the medical school. The students would learn how to play, but not how to work; and they would be apt to acquire a way of speaking our language which would make them unintelligible to their patients. Even if the attempt succeeded, the example of Cambridge (in spite of the energy of men like Professor Humphry) would seem to show that the success would not be brilliant, and the result scarcely worth the effort. The real service which Oxford and Cambridge can do for medicine is not directly, but by sending up men thoroughly trained in physics, in chemistry, and in biology; and if circumstances enable Oxford to offer in addition the splendid opportunities for studying physiology which Dr. Foster and his pupils have made at Cambridge, both the ancient English Universities will be doing the proper work which our profession and medical science may fairly demand.

But what we most of all want is a real University education here in London. We have already the materials for the largest and best medical faculty in the world. We have magnificent hospitals, museums, libraries, lecture-theatres, and more than 2,000 students. Each of the great medical schools is a college in itself, with the traditions and the loyalty out of which universities are made. Lastly, we have the nominal University of London which, as an examining body, probably does its duty more conscientiously, wisely, and usefully than any other. What is needed is that these materials should be utilised and combined.

At present too small a proportion of our students even attempt to gain a London degree. We want their number to be increased, not by making the degree easier, but by improving scientific training. We want more intercourse between the several schools, combination or union among the smaller ones, the establishment of central lecture rooms and laboratories for all students of the University, and increased opportunities for advanced study among our senior students. The work which has been done in building laboratories and providing improved facilities for scientific work in St. Bartholomew's and in University College (to take only two

examples) is worthy of all praise, but much remains to be done. There are courses of lectures which form a very suitable part of a University system, but can scarcely be adequately supported by even our largest medical schools—I mean on such subjects as the history of medicine, experimental pathology, medical jurisprudence, mental pathology, comparative anatomy, experimental therapeutics, and animal chemistry. These ought to be undertaken by the University, with the necessary libraries, museums, and laboratories; and that it can undertake such functions with success is shown by the admirable results which have followed the foundation of the Brown Institution. So long as the Senate persist in regarding themselves as a mere examining Board, the most important duty of the University will be neglected; and it can never excite the interest which it ought; for who ever loved a Board? But already, by the elaborate and carefully adjusted curriculum which it prescribes, it is in effect an educating body. No other institution can form so independent and useful a centre to unite and direct the scattered energies of our separate colleges. No other has so well deserved to take such a position of dignity and service. I would be the last to recommend that the high standard of the London examinations, which has done so much for education, should be lowered. Teaching must be brought up to that standard, not examination brought down to the existing level of teaching. We may hope that modified regulations as to time and frequency of examinations may shortly stimulate the already increasing proportion of candidates from our medical schools. But what is most wanted is that combination and co-operation should take the place of isolation; and that opportunity and encouragement should be given to those higher studies which will always be pursued by but few, yet which are essential to the progress of science. The question of funds is a secondary one. If the University began a work of national importance, there would never be lack of support in wealthy England. Indeed, so necessary is the establishment of a true University in London, in which medical science would be worthily cultivated, that it must one day be under-

taken by the State unless anticipated by the healthier, and in every way more desirable, action of the Senate and the colleges.*

In conclusion, I must say a word in answer to the objection that by "over-educating" our students we shall unfit them for the homely duties of medical work; that by making them too scientific we shall make them less practical. This, surely, is a vulgar error. Is it possible to "over-educate" those in whose hands will lie the health of the community as well as the lives of individuals? Do we find that increasing science, *i.e.* greater knowledge, leads to less efficient practice, *i.e.* application of knowledge? The self-styled "practical man" is in reality the most obstinate of theorists, but his theories are all wrong; for ignorance is more theoretical than science. Ignorance cannot endure to confess itself; where facts are wanting, it supplies fiction; only the scientific temper can endure reasonable doubt, where the materials for decision are wanting. I believe my hearers will bear me out when I say that the less our patients know the readier they are with theories and explanations. In fact, popular superstitions do not rest on erroneous observation; they rest on the long exploded theories of the learned. Homœopathy and allopathy, metastases and dyscrasias and *vis medicatrix nature*, these are the ghosts of our forefathers' doctrines, driven from the places they once usurped, but not yet effectually laid.

If it be admitted that a man who has in charge the lives of soldiers or of paupers ought to have the same knowledge as he who prescribes for a king, it may yet be argued that those who are trained by a long and thorough course of education will not be willing to accept the scanty gains of the poor-law surgeon. The difficulty must be met in one of two ways, either by Government providing medical education for the public service at a cheap rate, as is done in Germany

* See Note C.

and Russia, a plan which the profession undoubtedly would oppose, and which, on other grounds, no English minister is likely to bring forward, or else by Government paying more highly for skilled services—a result which must come, and the sooner the better for the country. If, lastly, it be urged that, by increasing the skill and knowledge of the profession (and probably diminishing its numbers) we shall increase the number and the gains of prescribing druggists and other unqualified persons, I maintain that of two evils this is far less than sending out under the license of second-rate corporations and third-rate universities men who are as really unqualified as the quacks with whom they will contend on equal terms. There always must be abundance of legally unqualified practice; the upper classes are just as fond of bonesetters and other charlatans as are the poor. All that Government is bound to provide is that paupers and public servants should have access to the best medical skill: all that the profession has a right to demand is, that its portals should be guarded from unworthy members, and that the public should be enabled to distinguish between those who have been taught their business and those who have not.

I trust I have shown that we need not be ashamed of the present state of medical education, though we have every reason to desire and to labour for its further improvement.

A union of the two colleges for the ordinary diploma, combination between the smaller schools, a development of the University of London, so as to supply a centre of higher education, these appear to me to be the most practical and important objects at which educational reformers should aim.

It is organisation and opportunity which we chiefly need. Our material is excellent. No one can look back, even twenty years, without recognising the great improvement which has taken place in the previous education, and in the

scientific capabilities of our students. They are the hardest working set of men I know—the most free from affectation, the most eager to learn, the most apt to follow. They have laboured under great disadvantages, but many of these have been removed and others are ripe for removal. I have endeavoured to point out some of the latter, and to warn against giving up the ground which we have already gained.



APPENDIX.

[Note A.]

The question whether medicine is a science or an art was discussed by that accomplished physician, the late Dr. Barlow, in his Hunterian Oration before this Society.

The ambiguity of the word medicine has, it seems to me, alone obscured the issue. The principles of medicine—medical science—is another name for pathology, the science of diseased actions. This is a branch of physiology, and must be prosecuted by the same methods; descriptive anatomy of diseased organs, morbid histology, pathological chemistry, observation of disease in human beings, and experiments upon animals. On the other hand, the practice of medicine—*ars medica*—the healing art, is not, and can never be, a science. If it be argued that therapeutics may become a science when we have ascertained the precise effect of all our drugs; I answer, that the reaction of the normal human body under the absorption of chemical compounds (experimental pharmacology) is again a branch of physiology. But valuable as this branch of science is even already, as an indication or a warning, the conditions of disease are so complicated that we cannot hope ever to deal with them, even by drugs of known physiological action, except empirically. For the art of medicine—practical therapeutics—includes such diverse operations as cutting out a stone, pulling out a fœtus, killing an acarus, rooting up and poisoning a parasitic plant, tying an artery, dissolving or precipitating a salt, artificially supplying special constituents of food, or digestive ferments or secretions which are wanting, regulating temperature, removing a useless limb.

The relation of therapeutics to physiology, normal and morbid, is like that of navigation to astronomy, or engineering to mechanics, or politics to the science of wealth; the art depends on the science, not only for its rational foundation, but for the whole spirit and tone of its conduct. The two are as inseparable, yet as distinct, as knowledge and skill, as right thinking and well doing.

[Note B.]

Subject to the consideration mentioned in the text, I agree with Mr. Rivington* and with Dr. Dupré† in thinking that for most future medical students, as for most other boys, it is desirable that classics and geometry, with some one branch of natural science practically taught, shall form the chief subjects of a liberal education. I have elsewhere‡ given reasons for considering botany as generally the branch of science best fitted for school education, and, next to it, elementary physics. With respect to Greek, it is no doubt useless to attempt to teach it, when boys are taken away from school at fourteen to earn their living. They must be content with Latin, or even with their mother tongue. If they can be taught to care for good old English reading, so as to take delight to “browse upon that fair and wholesome pasturage,” they will little miss any other literature than that of Greece, and may even (like the medical student of the Borough Hospitals who wrote *Hyperion* and the *Ode on a Grecian urn*) catch not a little of the classic spirit at second hand. At all events, it is absurd to suppose that studying German, a language rich and powerful indeed, but unformed and ponderous in its structure, like English before Dryden and Temple, can supply the mental training of the polished languages of antiquity. French is, on every ground of precision and perfection of structure, a better substitute. And as to literature, no one will pretend that a boy will be any nearer to appreciation of Göethe and Lessing, or of Pascal and Molière by stumbling through Ollendorff and *Le Traducteur Français*, than he would be to appreciation of Sophocles and Plato by stumbling through his *Greek Delectus*. But if the process of construing and composition were more separated from study of the literature, and if, after allowing due time for the former description, teachers would more frequently give boys a rapid course over at least one book of Homer, or let them follow the whole account of the Syracusan expedition in Thucydides, or the return of the Greeks in Xenophon, surely they would find that at least half the class would not “hate Greek” ever afterwards.

The argument derived from the importance of Greek in scientific

* In his Hunterian Oration last year.

† In his Introductory Lecture at Westminster Hospital, October, 1879.

‡ Address to the Physiological Section of the British Association at its Sheffield meeting.

language may be easily overstated, but it must not be forgotten. Even a fair scholar might not remember that *ἀδῆν* means an acorn, and *βρωμος* a stench, or (if he had not happened to read *The Knights*) that *ἀλλαντοειδής* means sausage-shaped; but when he had looked up such words in his lexicon, he would always associate a meaning with them; and then words like bronchophony and myelitis would be at once intelligible. The humblest acquaintance with Homer would make it easy to remember the usual locality of zona, and to associate the phrenic nerve with the diaphragm.

Probably Greek, as a universal element of a liberal education, will in time be banished, and only then will its practical use be appreciated.

In this connection I may quote the following expression of opinion from one who will not be suspected of depreciating the scientific side of education:—"The two classical languages, Latin and Greek, have, beside their exquisite logical subtlety and æsthetic beauty, an additional advantage; they indicate accurately the relation of words and sentences to each other by numerous and distinct inflexions. Languages are, as it were, abraded by long use; grammatical distinctions are cut down to a minimum for the sake of brevity and rapidity of expression, and are thus made less and less definite, as is obvious from the comparison of any modern European language with Latin; in English the process has gone farther than in any other. This seems to me to be really the reason why the modern languages are far less fitted than the ancient for instruments of education."*

[Note C.]

If the University of London were to enter seriously on the course of action recommended, the first step would be to alter the tone and spirit which the Senate have for many years adopted; to admit that even good examinations are not everything; to invite co-operation; and to foster the growth of interest in the University by its graduates.†

* This extract is taken from the first of the *Populäre wissenschaftliche Vorträge* by Prof. Helmholtz. They have since been translated into English, and published by Longman.

† It is an almost incredible fact, that some members of the Senate have drawn arguments from the mischief which is done to education at Oxford and Cambridge by the enormous wealth of the Colleges, to deprecate attempts to supplement the niggard hand of the Treasury by modest endowments, for the want of which education in London is starving.

The University would have to take a more independent position with reference to the State, and might well bargain for possession of its own house and an annual grant in aid, which would bear some relation to the sums spent on University education in Scotland and Ireland.* It would probably become necessary to cultivate closer relations with the Colleges on which the University ought to depend for its strength. It might even be desirable to give to Convocation, or to a Board of Professors, examiners and teachers selected out of Convocation, some share in the government of the University, such a relation to the Senate as, for instance, the Boards of Studies at Oxford have to the University Council.

But all such changes would in themselves be unmixed benefits. They are the very changes which those who care for the credit and usefulness of the University desire, and which have been formally recommended to the Senate by an unanimous Resolution of Convocation.

In 1877, a requisition of 72 graduates asked for an extraordinary meeting of Convocation, to discuss the following Resolutions :—

“ That it being manifestly inexpedient that frequent application should be made to the Crown for new or additional charters, it is desirable that provision should be made in any such charter for all changes in the constitution of the University, either at the time urgent or likely to be soon required ; and that it being probable that initiative measures will be shortly taken towards procuring such a new or additional charter, the following proposals require the serious consideration of Convocation and the Senate :—

“ 1. An enlargement of the powers directly exercised by Convocation.

“ 2. An increase in the proportion of senators to be nominated or elected by Convocation, and the limitation of the tenure of office in the case of all senators to a term of years.

“ 3. *The encouragement of mature study and original research among the members of the University, by the establishment of University Lectureships, of limited tenure, in different departments of learning and science.*

“ 4. *The introduction into the constitution of the University of such modifications as may remove all reasonable ground of complaint, on the part of any of the affiliated Colleges, with respect of the absence of means of expressing opinion and giving advice to the Senate on the examination regulations, and on the changes proposed to be made therein from time to time.*

“ And that a special committee of ten members of Convocation be appointed to consider the above-mentioned proposals, and to report thereon to Convocation as speedily as possible.”

* An official voice has already said, “ It is unwise not to look forward to a time when the present grant will either be withdrawn altogether or be converted into a fixed Annuity for Exhibitions and Prizes.”

The Annual Committee, however, took up the question, and had begun to deal with it when the more pressing question of the admission of women to the University came on. It was then postponed in deference to the wish of the Senate that this long pending question should first be settled, and with something like a promise that the other matter should not suffer for the delay. Its consideration was resumed in 1878, and a sub-committee appointed to consider and report "by what measures the connexion of the affiliated Colleges with the University may be strengthened, and generally how the objects of the University in the promotion of sound learning and liberal education may be more efficiently attained."

The result was a Report to Convocation, from which the following paragraphs are extracted:—

"When, 40 years ago, the University was incorporated, two circumstances chiefly justified its foundation; first and principally, the religious restrictions which excluded large classes of her Majesty's subjects from the great English Universities; secondly, the unsatisfactory character of the examinations by which degrees were then obtained.

"The religious disabilities which then existed have now been removed; and the systems of examination, not only in Oxford and Cambridge, but also in Edinburgh, and other Scottish Universities, and in the legal and medical professions, have been gradually but largely reformed.

"At the present time, therefore, the University of London can claim neither the exclusive honour of unsectarian liberality, nor that of unrivalled efficiency of examination. While the severity of our examinations has continually increased, and the estimation of our degrees has steadily and deservedly risen, it is not true that any considerable number of graduates from Oxford, Cambridge, Dublin, or Edinburgh seek for the additional honour of a London degree. Nor is it true that our University is distinguished from others by its examiners being entirely unconnected with its teaching bodies. For in the older Universities examiners are sometimes chosen from beyond their pale, and it is notorious that in our own University a large number are annually appointed who are connected with its Colleges and Medical Schools. Indeed the boast, if true, would be of doubtful value, since few who are practically acquainted with examining and with teaching would doubt that familiarity with the course and methods of study of a University

or a College is not less important than the independence and the stimulating innovation which may be expected from an outsider ; and still fewer would question the discretion and success with which the Senate has combined both advantages in the examining body of this University.

“ Your Committee believe that it will contribute to the future reputation and usefulness of the University that there should be closer union between the Central Body and the Teaching Institutions, and that education and research be recognised as functions of the University no less than examining and conferring degrees.

“ It is probably needless to offer reasons why ‘ the promotion of sound learning and liberal education ’ is justly esteemed the highest function of a University. Examinations are one of the most important means to this end, and the beneficial influence of the broad and searching system of examinations which has been gradually elaborated during the past 40 years by the Senate, is one of the best titles of the University of London to public respect. This influence has been exerted upon all the higher education of the country, directly upon the Schools which send up candidates for matriculation and the Colleges and Medical Schools from which the greater number of our graduates come, and less directly upon professional and scientific training generally, as well as upon the examining systems of the older Universities.

“ The teaching function of a University must of necessity be for the most part fulfilled by its Colleges, and it is in order to produce greater harmony between the educational and the examining bodies of the University of London that your Committee desire the closer relations between them which are the object of the former part of this Report.

“ But your Committee believe that there are certain departments of instruction which can be more efficiently occupied by the central body of the University than by any of its Colleges. Subjects which are of secondary professional importance are peculiarly apt to be neglected in institutions which, like our medical, legal, and scientific schools, are primarily technical in their aims. This is eminently and dangerously probable in a metropolis and a commercial community. And your Committee conceive it to be one of the most useful functions of a University to secure for such subjects the attention which on the principle of supply and demand they would often fail to secure.

“Some of the subjects referred to (as Comparative Philology, Oriental Literature, Zoology, Botany) are already taught in the institutions affiliated to the University; but often imperfectly, from the small number of those who study them. If University chairs of such branches of learning as the Senate might think most suitable were founded, your Committee believe that the Colleges and medical and other Schools would be relieved of what is a constant difficulty, and that the subjects would be far better taught. It may be that some of them might be undertaken by combination among certain of our teaching institutions. The want of such co-operation has been long felt as the most conspicuous defect of medical education in London.* One good result of increased co-operation between the examining and the teaching bodies would be to bring the latter also into closer intercourse with one another; and it is probable that this might be facilitated in individual cases by the good offices of the Senate.

“Here is a somewhat different class of subjects from which we believe that the University might also with advantage select for its own teaching, namely, those advanced branches of learning which can best be studied by men who have gone through a College course, and are no longer straitened by the prospect of successive examinations to be passed. No years are more precious or more often wasted than those which intervene between graduation and active employment in professional life. It is at this time that the mind, disciplined by sound training and stored with acquired knowledge, is best able to enter upon special departments of pure science, and to advance knowledge by mature study and independent research. To aid in this object, to detain the graduate *inter silvas academi*, and guide him in the pursuit of knowledge, seems peculiarly the office of a University as distinct

* In a letter to the *British Medical Journal* (March 2, 1878), Mr. Savory says—“I think all must admit that the usual mode of teaching anatomy, physiology, chemistry, and botany in our Medical Schools is very far from being satisfactory. With the exception of two or three of our largest schools, the classes are too small to afford the least encouragement to any teacher. If, instead of having the classes on these subjects split up among a number of small schools, the natural sciences were all taught at one place” (or “at some one or two central Colleges”) “it is not difficult to foresee that the gain to our students would be immense. The classes would be so large that the services of the best men could be secured for teaching, and the appointments would be so valuable that they would be earnestly sought for their own sake.” See also the evidence by Prof. Gairdner of Glasgow, before the Committee of the House of Commons on the Medical Act Amendment Bill (*Ibid*, March 13, 1880; and his letter to the *Lancet*, April 3, 1880.)

from a College. Your Committee therefore believe that the Senate might with great advantage consider the advisability of founding University chairs in subjects, of which the following list may serve as an illustration :—The Higher Mathematics, the critical Study of Classical Authors whose works rarely form part of an examination or of a College curriculum, Jurisprudence and Public Law, the History of Medicine, Public Health and Forensic Medicine, certain departments of Mental Philosophy and Ethics, of Human and Comparative Anatomy, of Pathology, of Chemistry, or of Physics.

“ As examples of the kind of lectures meant, your Committee may refer to the Hunterian Lectures at the College of Surgeons, the Goulstonian and other lectures at the College of Physicians, and the Brown Lectures, which have already and with signal success been instituted by the Senate.

“ It would be necessary, in order to reap the full benefit of such means of promoting the higher learning, for many of the lectureships to be provided with laboratories or museums or libraries, and in some cases these would be the primary and more important means of promoting the advance of the science, to which the lectures would form a useful adjunct as a means of exposition. Here, again, your Committee are happy in being able to refer to the solid results which have followed the wise audacity of the Senate in refusing to confine their labours to the superintendence of examinations, and accepting the responsibility of an endowment. The laboratory of the Brown Institution is a standing proof that it is only necessary to open a room where men can work, with very moderate and inexpensive aids, in order to call forth original research of the highest order. There seems no reason to doubt that those of our graduates who at Oxford, Cambridge, Manchester, and Edinburgh are at the head of great scientific laboratories would have been equally useful and distinguished in their own University.

“ The question of funds is, no doubt, a serious difficulty. The University of London is in the unfortunate position of being so dependent on the support of the Treasury that it fails to attract the private munificence which has enriched not only the ancient English Universities, but those of Edinburgh and Glasgow, and Colleges in Manchester, Birmingham, Bristol, and other great towns—institutions, many of which at the same time receive, or demand, liberal aid from Government. On the other hand, the University has never received—partly, perhaps, because it has never asked—such support from the State as would enable it to

fulfil the true functions of a National University, or would put it in comparison with the poorest University of Germany.

“The large and difficult question of the relative advantages of private endowment, and of State patronage and control is one upon which your Committee need not enter. The example of other learned bodies proves the possibility of appealing with success to the State for grants in aid of learning and research of an unremunerative kind, when work done can be shown; and the same example shows that the public liberality may be confidently appealed to, so soon as a learned institution occupies an independent position of acknowledged public usefulness. At the present time, the Treasury spends annually a certain sum of money in the promotion of unremunerative researches of national importance, which was until lately administered by Mr. Simon; and the results which he obtained with very scanty means are too great and too well known to need more than this reference. Again, if the University of London were seriously to undertake the duties thus indicated, there is every reason to hope that a modest share in the practically boundless resources of this City would not be entirely refused to the Metropolitan University. There are many trusts and funds which would be available for such purposes, and in time we might hope to see a University of London like that which was foreshadowed by Cowley, or like that which a century before was nearly founded by the munificence of Sir Thomas Gresham.

“It is not proposed, even as a subject for discussion, that an extensive scheme should be elaborated. Progress will be most sure if gradual and tentative. The first step has been already taken, and your Committee has pointed out its encouraging success. At present, all that is asked is an expression of opinion from Convocation in favour of the contemplated changes. If the want were acknowledged, and it were understood that the Senate was anxious to extend the usefulness of the University in the direction indicated, the next important step would be taken; the rest might be safely left to time, and to the increasing enlightenment of the nation.

“Your Committee, therefore, recommend the adoption of the following Resolution:—

“That it is desirable that the University should take advantage of such opportunities as may present themselves of promoting, by the institution of University chairs or otherwise, the cultivation of such higher or less usual branches of study as can be more conveniently, or more efficiently, taught by a central body.

“ Meantime, however, there is one method by which, without departing from the functions of an examining body, the University might, in the opinion of your Committee, render essential service to the advancement of learning ; it is by admitting the importance of independent research in the examinations for the higher degrees. The following Resolution is, therefore, recommended for adoption :—

“ That it is desirable for the Senate to consider the importance of recognising independent research in the examinations for the higher degrees in such way as the Senate may approve.

“ Convocation will perceive that the measures recommended in the preceding paragraphs all tend in the same direction and support one another.

“ Closer connexion of the Affiliated Colleges with the University would strengthen its position and be advantageous at once to its examining and its educational functions. It would probably lead to more co-operation among these Institutions, and thus to more efficient study. By the University itself undertaking certain parts of the teaching duties, its claims upon the loyalty of the Colleges would be further strengthened, as well as the progress of knowledge advanced. The recognition of the importance of investigation, as distinct from mere acquirement of knowledge, would be a useful addition to a system of mere examination ; it would favour the higher studies of our Colleges, strengthen the claim of the University to more liberal public support, and give it increased dignity and importance in the eyes of its graduates. In a word, the policy which your Committee would urge the University to adopt is one which aims at increased independence, increased union with and co-operation among its members, and more active services in the advancement of knowledge.”

The two Resolutions above quoted were passed, and the Report sent up to the Senate in May, 1878 ; and there are rumours that changes in the examinations for the M.D. and D.Sc. degrees are contemplated, in accordance with the second Resolution.